

Claims

1. Metal-ceramic composites for friction/slide applications, characterized by base compositions consisting of one or more metallic phases in a proportion of 30 to 75 vol.%, preferably aluminium and its alloys, and one or more non-metallic inorganic components in a proportion of 25 to 70 vol.% as ceramic materials, preferably silicon carbides, aluminium oxides, titanium oxides and silicates.
2. Metal-ceramic composites according to Claim 1, characterized in that the composition contains 40 to 60 vol.% of Al_2O_3 and 60 to 40 vol.% of Al.
3. Metal-ceramic composites according to Claim 2, characterized in that the thermal conductivity is greater than 50 W/mK, the flexural strength is about 300 MPa and the modulus of elasticity is about 160 GPa.
4. Metal-ceramic composites according to Claim 1, characterized in that the composition contains 60 to 80 vol.% of SiC and 40 to 20 vol.% of Al.
5. Metal-ceramic composites according to Claim 4, characterized in that the thermal conductivity is at least 180 W/mK, the flexural strength is about 300 MPa and the modulus of elasticity is about 200 GPa.
6. Metal-ceramic composites according to one of Claims 1 to 5, characterized in that the surfaces in contact with a friction/slide partner have an Ra value below 1 μm .

7. Sliding ring made of one of the metal-ceramic composites according to one of Claims 1 to 6.
8. Slide/friction pairings based on the metal-ceramic composites according to one of Claims 1 to 6 or on a sliding ring according to Claim 7, characterized in that the following pairings can be used: one partner consisting of a metal-ceramic composite (MCC) and one partner consisting of MCC, carbon, Al_2O_3 , SSiC , hard metal (HM), ZTA (Al_2O_3 and ZrO_2) or plastic, optionally fibre-reinforced.
9. Slide/friction pairings according to Claim 8 as axial face seals in cooling water pumps, characterized in that the following material pairings can be used: MCC/carbon, MCC/ Al_2O_3 , MCC/ SSiC , MCC/MCC, MCC/HM (hard metal), MCC/ZTA ($\text{Al}_2\text{O}_3 + \text{ZrO}_2$).
10. Slide/friction pairings according to Claim 8 as axial face seals in dishwashing machines, characterized in that the following material pairings can be used: MCC/carbon, MCC/ Al_2O_3 , MCC/ SSiC , MCC/MCC, MCC/HM, MCC/plastic, optionally fibre-reinforced.
11. Slide/friction pairings according to Claim 8 as axial face seals for direct fuel injection, characterized in that the following material pairings can be used: MCC/carbon, MCC/ SSiC , MCC/ Al_2O_3 , MCC/MCC, MCC/HM, MCC/ZTA.
12. Slide/friction pairings according to Claim 8 as axial face seals in CO_2 compressors, characterized in that the following material pairings can be used: MCC/ SSiC , MCC/ Al_2O_3 , MCC/MCC, MCC/HM, MCC/ZTA.

13. Slide/friction pairings based on the metal-ceramic
composites according to one of Claims 1 to 6 between
braking, bearing, sealing or drive units, for example in
lifts, escalators, cranes, dry couplings, pumps and
compressors, pistons and cylinders, swash plates, radial
bearings or axial bearings, bearings of grinding cylinders,
and slide partners for rotary shaft seals.
14. Slide/friction pairings based on the metal-ceramic
composites according to one of Claims 1 to 6 in lubricant-
free areas of use, for instance in the pharmaceutical and
cosmetic industry or in food technology.
15. Slide/friction pairings based on the metal-ceramic
composites according to one of Claims 1 to 6 in sanitary
ware fittings or industrial fittings.
16. Slide/friction pairings based on the metal-ceramic
composites according to one of Claims 1 to 6 for side plates
in fuel pumps or power-assisted steering pumps.
17. Slide/friction pairings based on the metal-ceramic
composites according to one of Claims 1 to 6 for rollers
and/or bearing units in combustion engines, compressors or
exhaust valves.
18. Slide/friction pairings based on the metal-ceramic
composites according to one of Claims 1 to 6 for valve
drives in diesel engines.